

Presenter: Professor Brian Fildes - 2017

Title: What does the future hold for autonomous vehicles in Australia? (17:16)

<i>Time</i>	<i>Dialogue</i>
00:10	Thank-you. What I'd like to talk about is the whole issue of vehicle technology both past as well as future. The first automobiles were invented around about the late 1800's. This is one of several different generations that were designed. Initially they were steam driven but before very long the internal combustion engine took over and steam disappeared so this technology really saw the end of the horse and buggy era.
00:44	It was a disruptive technology. 1896 – The first automobile accident that's been reported. It's an interesting crash. The two occupants who were seated in the front of the vehicle were ejected and died as a result of the crash. The crash happened by the way at 20km/hr. fairly low by today's standards. The back wheel actually shredded. You can see that in the photograph and in doing so the occupants were ejected out of the vehicle.
01:18	So the coroner who investigated this crash found that the problem in the crash was obviously the wheel that had fallen apart and the reason for it was that it wasn't made out of good English oak. It was in fact a German design. [Laughter]. Read what you like from that ... but he also claimed and this is quite ironic, "That this must never be allowed to happen again". Interesting comment.
01:51	If we go now into the 1900's, clearly this was the revolution, the technical revolution I guess that has pretty much driven most of what we know about private transport since. In 1910 approximately, Ford through their wonderful production line technology or techniques developed this vehicle, the Model T. In its time it was really quite a productive unit. Quite an important unit but what it did demonstrate that technology was really well and truly underway in the 1900's but unfortunately so were road crashes.
02:39	By the mid 1950's, these are statistics from our Federal Government, there were more than 82,000 Australians killed in road accidents in just that 50 year period. That figure by the way for your information, the dotted line shows the level of motorisation, the number of vehicles that are registered and the top line in the number of people that were killed and it's interesting that up until about 1970, literally the death toll followed the number of vehicles.
03:17	In other words the more people you put out here the more people you are going to kill. Just for comparison the 82,000 people who were killed in road crashes was about the same as the number of people who were killed in World wars during that same period. [WWI-60,000 and WWII-23,000 killed]. Now around about 1960 these sorts of statistics lead our Governments to start thinking about the need for better regulation of vehicles.
04:31	And indeed in Australia the Australian Design Rules system which you may know or not about. It's a system that specifies to manufacturers what level of safety they have to design into their vehicles, came into being and as a result of that a whole range of new technology started to appear. Not so much in terms of the vehicle itself but in terms of the safety of those vehicles. Things such as seat belts and more recently air bags and various other technologies and I'm sure you read about them every day in the paper.
04:19	However while today new cars are as safe and efficient as they have ever been we are still killing over a million people a year somewhere around the world in road accidents. Over a million people and to bring it closer to home, in Australia during the 1900's we killed more than 170,000 people in road accidents. These are vehicle accidents. They are not other types of accidents. So just think about that number, 170,000 people. Can you imagine what that would be like? If you are in to Football that's about 2 grand finals of crowds killed as a result so f road accidents. So it's a serious problem and still is.

Time	Dialogue
05:10	So what about the future? Tony Seba, the gentleman here, published a book recently called 'Clean disruption of energy and transportation'. What he claims in this book is technical development is being driven by disruption. Disruption meaning one technology is disrupting another. A previous one. He predicts that by 2030, all new private transport will be electrically driven. It will be driverless or autonomous and you will use service vehicles rather than own your own car.
05:53	That's 13 years from today he claims that this will be the situation. I want to explore a little bit of that with you. We won't, he says, we won't own our own cars, so that reduces parking and congestion and a whole lot of other issues, but it saves a lot of money in your pocket. He claims that only 5% of what you spend today on private transport will be necessary if this model was to occur. But I guess the question is really how likely is all this to happen?
06:28	I want to go through each of those three issues that he raises because it gives us a greater knowledge. Firstly the issue of electric cars and there are many of them. There is just a sample of the ones that I know about. They are available but they tend to have limited mileage. You can only drive them for a certain distance although again this is rapidly changing. The two in the top corners, the right and left cars today, the Tesla and the new General Motors Volt, I think it is called, will promise you over 400km so you can see that already battery technology is changing.
07:09	Now the second claim was that we would all be driverless or autonomous. There are indeed a number of vehicles that are currently available in autonomous or at least are still under development and there's a few that's just indicative of the vehicles that are available to run by themselves. Are they likely to be useful? Well there are trials currently going on around the world looking at some of the issues of running these vehicles on the roads.
07:53	In fact there was one recently announced here in Australia by Transurban . But there are a number of trials and the longest one is the Google trial which started in 2010 I believe. It covers 4 US states where people are allowed to drive vehicles autonomously. In other words without touching them [the steering wheel or foot pedals]. They have to have drivers in them at this stage in case but those 4 States will allow the vehicles to run by themselves.
08:09	It's interesting that we have now covered more than 2 million kilometres and they've only had 12, well they are reporting only 12 relatively minor collisions. Much less than what we see on our roads today. The third dimension that Seba talked about was the issue of service vehicles. These are some from Europe but we have some in Australia as well. Maybe some of you have already used a GoGet vehicle or a Flexicar , both of which are available fairly widely in Melbourne.
08:41	Current estimates suggest that these vehicles by 2020, that's only 3 years from now, will have a market of around 6 billion dollars and will have something like 12 million members around the world. So clearly they are developing and people are accepting them. The figure in the bottom there shows what the estimate is of our current usage of vehicles ... and it's as low as 4%.
09:09	This is where the savings will come, because with a service vehicle you can actually increase the usage of that vehicle across multiple users and in doing so it brings the cost down. The question is why would you want to own your own car when you can use one of these for around about 5% of what you are spending now? So that's some of the technologies rapidly developing and I would like to show that in the video if I could.
09:37	VIDEO – Dialogue: <i>Ride hailing apps are nothing new but cars that show up without a driver certainly are. Singapore based company Nutmoby launched a trial of what it said is the first driverless taxi service in the world. Members of the public are allowed to hail a free ride as part of the trial and the hope is a full passenger service will be launched from 2018 and an even bigger goal is for the technology to change the way we live.</i>
10:08	VIDEO – Dialogue: <i>This is really a moment in history that is going to change how cities are built and how we look at our surroundings, much like the advent of mass produced cars after world war two created a lot of cities in America and around the world. Autonomous cars are going to change how we actually build cities.</i>

<i>Time</i>	<i>Dialogue</i>
10:29	An ambitious claim. We were there recently and I think they are falling behind their timetable actually, but never the less it's an interesting display of what Seba was claiming a few years ago. I guess one of the other issues of course is well it's wonderful to have all this technology but will people actually use it? This is a survey conducted in 2013 buy a company CISCO, I think they are called and it was an international survey so they looked across 10 countries and they apart from other things asked two questions.
11:04	There up there. The first one is the blue bars, and that was a question saying 'Would you be prepared to ride driverless?' and the second one is the green bar which I thought was even cleverer, 'Would you let your kids drive in a driverless car?' Interestingly enough in both of those questions although there was variations across the countries [the answers] were relatively similar, so if people trusted themselves then they figured it was OK to trust their children.
11:35	So you can see overall the percentage was about 57%, so more than 1 in 2 across those 10 countries were prepared to drive in a driverless vehicle. Interestingly on the left most of those apart from the US are relatively developing countries and they seem to accept it much more than the ones on the right which are essentially fairly developed counties.
12:03	The US is interesting and I'm not sure why, but there is certainly a lot of strong interest in driverless vehicles in the US. Maybe it is driven by the Google trials but again it is pretty strong evidence that people are likely to buy into this technology when it becomes available. So ... are they likely to be safe? We are worried about the whole impact of road safety. Our Australian Government have now bought into this notion, or this philosophy I guess of a 'Towards Zero' outcome.
12:43	'Towards Zero' says no 'FATALS' [Fatal injuries] and 'No serious injuries'. A fairly major and difficult assignment given the sorts of trends we are seeing in road safety, but never the less there is strong evidence not just here but elsewhere that adopting such a philosophy may well give us some improvements in our attempts to reduce the road toll. So the issue is would autonomous vehicles of the type we have talked about actually help us actually achieve this.
13:18	Well, theoretically they should. These vehicles are fully technology driven and we know that one of the biggest problems in road safety are people making errors ... human error. Will the technology be flawless? Maybe not in the early years, perhaps later on as we get more familiar with it. What will happen when we mix, as we will, autonomous vehicles at the start with the current population of driver vehicles? Will drivers of today take advantage of these vehicles knowing that they will get out of their way?
13:57	Are we actually fully ready for it? Do we know what being fully ready for it is? That's another question. Do we have all the information about these vehicles to answer some of these issues? Will they actually reduce congestion? Maybe they will cause it to be even worse ... particularly with a mixed fleet? So there is a whole range of these things and we don't really have the answers for them at this stage.
14:23	Let me tell you a little bit about a program that we are currently involved in at Monash. This was really in recognition of some of the issues that we don't know very much about. We formed a consortium here at Monash to address some of these issues, at least the ones that we could address. So there was 6 departments across Monash University who put up their hand to be part of it. We believe this is fairly ground breaking research.
14:52	There is a lot of work being done on the technology side but not necessarily so much on the user side or the societal side. It clearly needs and we clearly have fairly good support by the major key stakeholders in this area. It was interesting that we had a workshop involving these people, almost 12 months ago and for the first time ever everyone turned up. So there was clearly a whole range of concerns about this whole area. Not just the vehicles but what systems, what infrastructure we need to maintain them.

<i>Time</i>	<i>Dialogue</i>
15:34	I guess the aim of this program, at least the pilot study is to try and understand what are the key issues? What are the things that we should be really focussing on because this technology is rapidly approaching us? What are the likely outcomes? What are the likely benefits or disbenefits of the technology? And that is really where I want to finish as well. In conclusion let me just say a few take home messages as well that you might want to think about.
16:00	The first one is despite what you might think now or might want there is little doubt that these vehicles are coming and they are coming at a rapid pace. So we have to accept it and what we have to do is obviously learn to minimise any negative effects of them. Gain the advantage of any positive effects and make sure as a result of this technology that there is an improvement both in terms of safety, in terms of cost reduction, both in terms of societal impact of these vehicles and so on.
16:39 17:05	And it is in that area really that we need our Governments to be much more active than they are today because without their involvement, I'm afraid that perhaps some of the community benefits that they do offer, if properly managed with good business models and good priorities may not be achieved. So I would certainly urge our Governments to get fully behind this. Thank-you very much.